NEW ZEALAND RAILWAYS

Staff Bulletin

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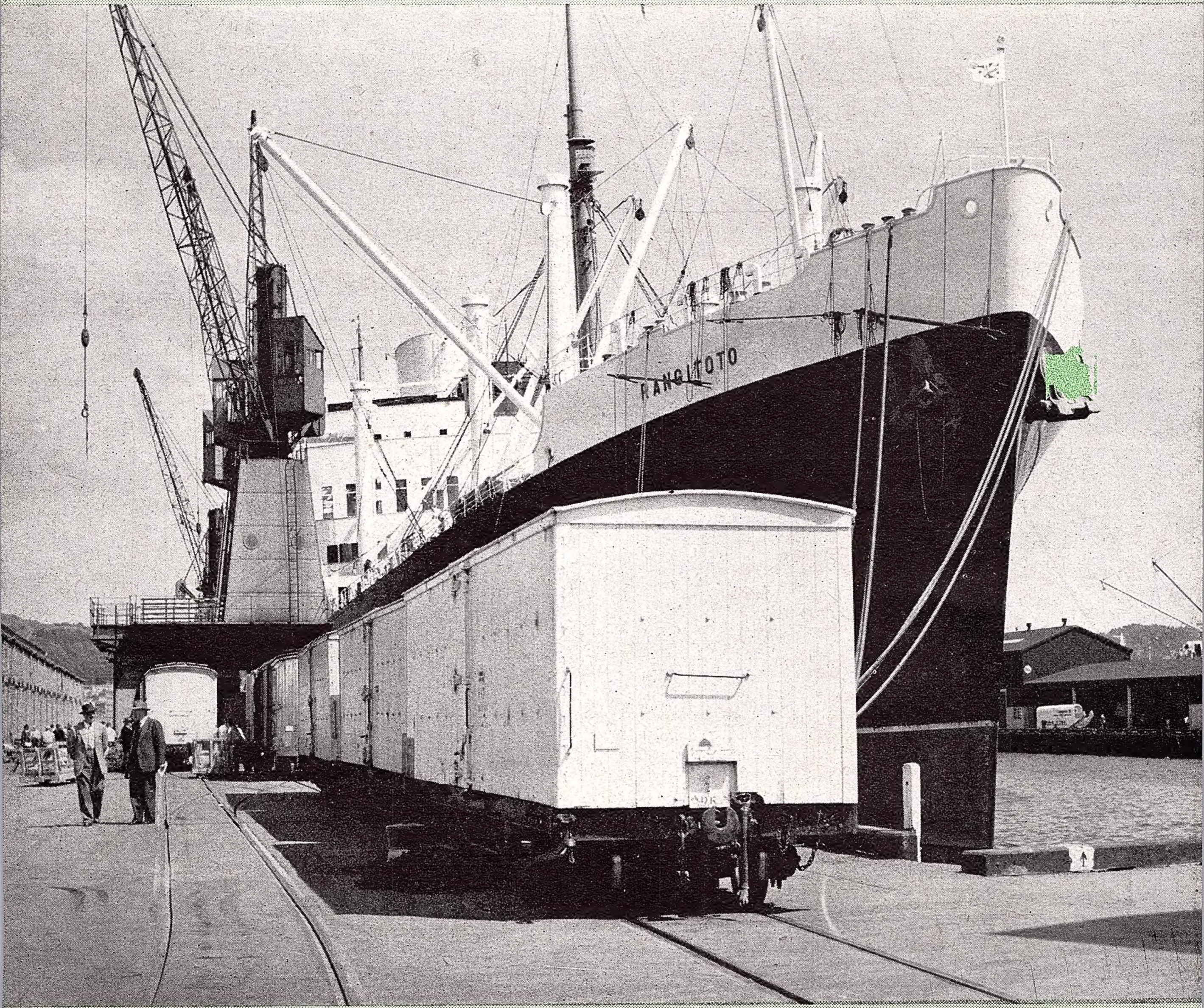


IN THIS ISSUE: New repair depot for diesels at Auckland (page 3)

FROM HERE AND THERE

AROUND THE RAILWAYS

RAILWAY MEDICAL OFFICER AT CHRISTCHURCH RETIRES

Doctor James C. Pairman recently retired from the position of Railways Medical Officer at Christchurch. He had served in this capacity for some 43 years, except for a short break during the 1914–1918 War. Writing to the General Manager on the eve of his retirement, he said: "I have enjoyed the work, and I should like to add that my relations with the staff have been most cordial at all times. I have found them most helpful, and their knowledge and capabilities of a high order."

Doctor Pairman's successor is Doctor T. A. Hurrell, F.R.C.S. (Eng.), F.R.C.S. (Edin.), Ch.B (N.Z.), M.B., who comes to the position with special knowledge of industrial and compensation problems and with high recommendations ●

TE KUITI - OKAHUKURA C.T.C.

The length of line controlled by C.T.C. from Te Kuiti was extended to 42 miles on 23 September, when the Porootarao–Okahukura section was brought into use. The Te Kuiti–Okahukura installation is the longest section of C.T.C. so far in use ●

LONGEST RAILWAY BRIDGE

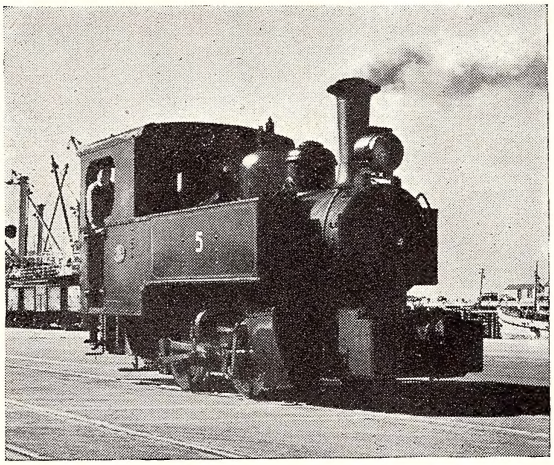
The longest railway bridge in New Zealand is the one over the Rakaia River, 34 miles south of Christchurch. It is just 1¼ miles long ●

DIESELS BOOST TRAIN LOADS

By September 1956 diesel locomotives were responsible for 32 per cent of the traffic (measured in gross ton-miles) hauled on goods and mixed trains. Compared with the average figures for the year ended 31 March 1954, the average loading of these trains has been boosted by the increasing use of diesel traction from 131 tons to 139 tons. At the same time, the average speed of these services has risen from 12·28 to 12·74 m.p.h. ●

FIFTY MILES OF TUNNELS

The total number of tunnels in use on New Zealand Railways at 31 March 1956 was 190 with an aggregate length of 51 miles 41 chains ●



PRIVATE RAILWAY TAKEN OVER

The Napier Harbour Board's private railway, comprising over three miles of track linking Ahuriri with the wharves at the Breakwater (nearly a mile away), was taken over by the Railways Department as from 4 February 1957. It is operated as part of Ahuriri station yard and worked by diesel shunting locomotives.

As a result of the 1931 earthquake, the main wharves in the inner harbour at Ahuriri (then Port Ahuriri) were rendered useless. The Napier Harbour Board consequently developed its deep-water facilities at the Breakwater and provided a line of its own to serve the new wharves. In 1952 the Department took over part of this line at the request of the Harbour Board, and agreed last year to take over the remainder.

Four small locomotives were used by the Board in recent years for shunting between Ahuriri and the wharves. Two were old N.Z.R. engines, one of which (a "D" class 2-4-0T) was converted to diesel operation. The other was a "Wa" class 2-6-2T.

Illustrated above is one of two small English-built tank locomotives also used by the Napier Harbour Board ●

NEW FLAT-TOP WAGON

A new prototype wagon of class "Ur" was placed in service in the South Island in September. It is, in effect, a 43 ft. bogie flat-top wagon similar to a "Ub", but designed to carry standard 42 ft. rails without need for runner wagons ●

COVER: Laden with frozen meat for England, these "Vb" wagons contrast boldly with the hull of the R.M.S. *Rangitoto*, berthed at Wellington. See page 8 for an article outlining the Railways' contribution to the development of New Zealand's frozen meat trade.

N.Z.R. Publicity Photograph

NEW DIESEL DEPOT AT PARNELL

NOTHING like it has been seen in New Zealand before. The Parnell diesel depot is something strikingly new in locomotive repair facilities. In fact, it has been said that parts of the building are more like a motor vehicle showroom than a railway locomotive repair shop.

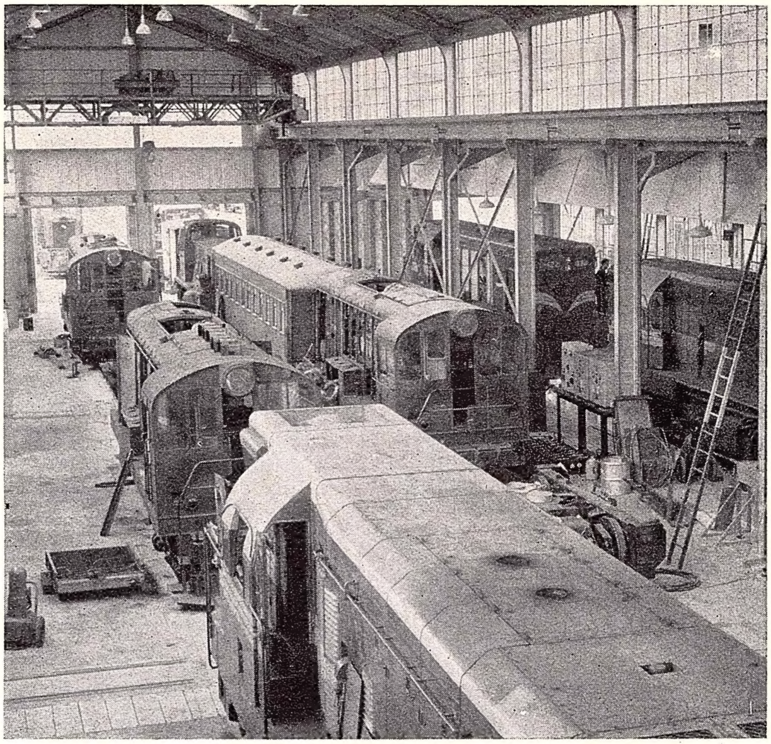
Every true railwayman knows that a locomotive – of any kind – can only be as good as the facilities for looking after it. This being so, the diesel locomotives and railcars in the northern district of the North Island should now be able to give the best possible account of themselves.

When it was decided to allocate railcars and a small number of diesel locomotives to Auckland district main lines, plans were put in hand to provide the servicing facilities without which they could not run the necessary high milages. An inspection and repair depot 160 ft. by 80 ft. wide with an attached workshop and store 240 ft. by 25 ft. was therefore designed for a site in Parnell gully, near Auckland railway station. Later, when 30 large diesel-electric locomotives were ordered from North America, it was decided to extend the length of the Parnell depot, construction of which had already begun, by 60 ft. and use it for inspection and repair of all diesel locomotives in the northern district as well as railcars. At present, therefore, it is providing regular facilities for 56 diesel locomotives and 6 railcars. In addition some of the locomotives from Frankton and Taumarunui districts are also dealt with as required.

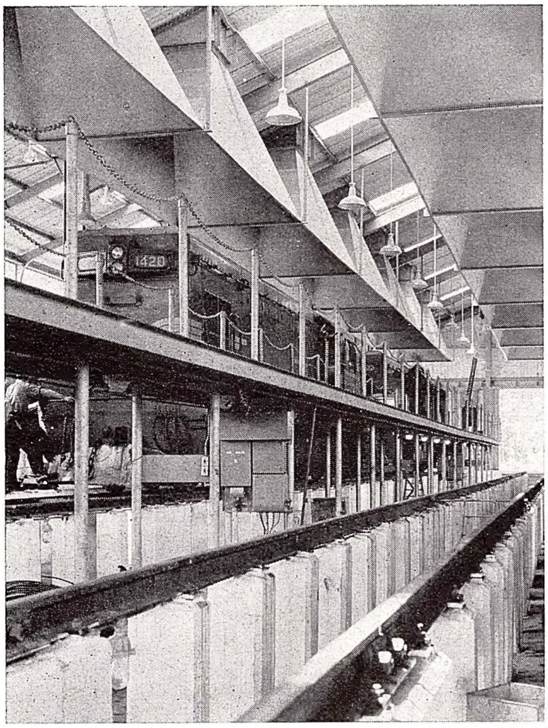
Perhaps the most striking feature of the new depot is the inspection bay, which looks as unlike the traditional idea of an engine shed or railway workshop as one could imagine. Here, the two tracks are served by floors at four levels. There is the usual floor at rail level; but there is also a raised platform alongside and between each track, while beneath the rails which are carried on concrete columns there is a depressed floor 3 ft. 6 in. below rail level. The pit floor itself is 4 ft. below rail level. The depressed floor of course is for the use of men working on equipment at the level of the wheels and axles and beneath the floor of the vehicles, and the elevated platform facilitates inspection and handling of equipment at footplate level.

In the heavy repair shop, the two tracks, equipped with ordinary pits, are earmarked for repair work rather than routine inspections. There is a drop-pit on each of these tracks, and two overhead cranes which run the full length of the building. A wheel lathe is yet to be installed.

Alongside the repair tracks the machine shop is equipped with the latest in machinery fashions. In addition to the usual array of lathes, drills, and work-



The repair shop at Parnell diesel depot, showing "Da", "De", and "Dsb" class locomotives undergoing overhaul.
N.Z.R. Publicity Photograph



ABOVE: The inspection bay at Parnell has floors at four different levels to facilitate inspection and handling of equipment. Exhaust fumes are extracted through overhead troughs.

BELOW: Rear view of Parnell diesel depot, showing the inspection bay (left) and the repair shop (right).

N.Z.R. Publicity Photographs

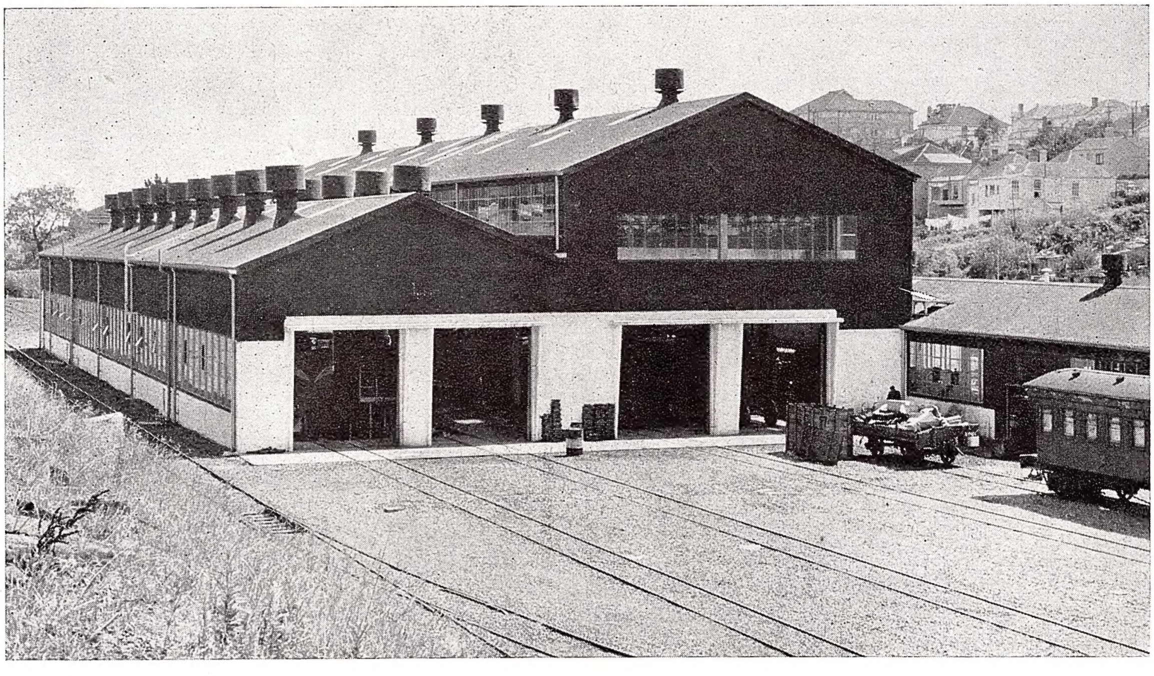
benches, there is a Wolf valve grinder, an elaborate test rack for ensuring the reliability of Westinghouse brake equipment on the "Da" class locomotives, and filter cleaning equipment. Hitherto the oil filters out of the diesel locomotives were cleaned with a steam hose. Now they can be cleaned much more thoroughly and efficiently in the tanks which form the basic part of the filter-cleaning plant.

In one corner of the machine shop is a nicely appointed first-aid room, and across the end of this building one finds the fuel-injection equipment test and overhaul room. With windows around three sides, this room is described as the most desirable part of the depot. Because fuel-injection equipment is one of the most vital parts of a diesel locomotive, extreme precision is necessary in looking after it. At Parnell, the principal items of equipment in this room are an English-made fuel pump test rack and an optical needle grinder of Italian manufacture. The latter machine looks like one that would be associated with dentist's equipment rather than railway locomotives. Such is the precision work required, however, that even dust must be excluded and arrangements are being made for this room to be pressurised to facilitate the work of keeping the dust down.

All in all, the working conditions at Parnell are described as among the best in the country. Lighting, ventilation, heating: all have been given much attention.

The illustrations indicate the good natural lighting, both through windows and skylights but, in addition, there is ample artificial lighting. Special features are the bulkhead lights beneath rail level and beneath the elevated platforms on the inspection tracks.

Heating of the workshop and test room is arranged by unit heaters of the forced-draught type. In summer the fans in these heaters are used to keep the air circulating and therefore as cool as possible.



Adequate ventilation of the running inspection roads in a diesel depot is important and is usually a troublesome problem, because diesel fumes are heavier than air. At Parnell, a forced ventilation system installed over the full length of the two roads has proved very successful. The diesel fumes are sucked out and dispersed without trouble through the exhaust troughs prominent in the accompanying illustration.

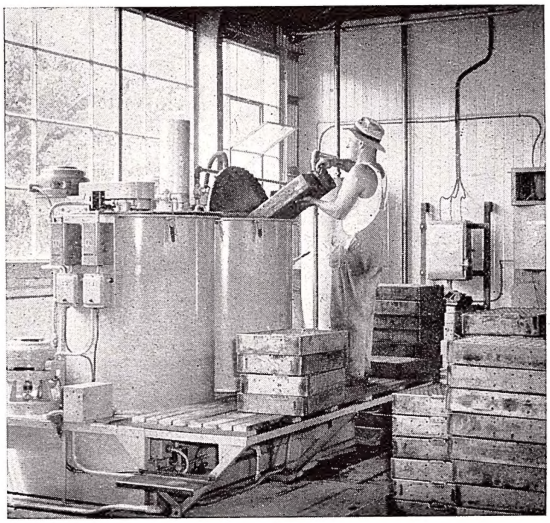
The 45 men employed at Parnell under Acting Depot Foreman H. G. Pointon also enjoy up-to-date amenities. A detached building 50 ft. by 25 ft. contains a spacious lunch room, hot-water facilities, stainless-steel bench and sinks, locker room, and toilet facilities, including showers. Provision is made for up to 80 men as the amount of work to be done develops.

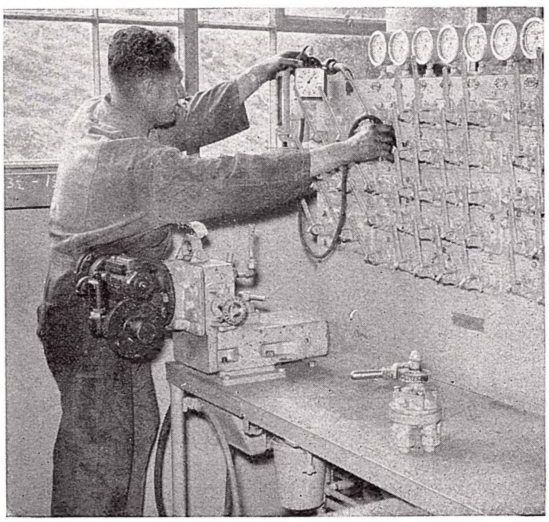
At present about two or three locomotives are being put through the depot each working day, a routine check normally being a one-day job. These checks are made after each 4,000 or 5,000 miles of running (depending on the class of locomotive) or 2,000 miles in the case of railcars. With diesel locomotives running something like 1,500 miles a week – on an average – each one visits the depot for inspection about once every three weeks. At 30,000 miles, and again at 60,000 miles, more intensive checks are made, including a complete oil change each time.

When our reporter called in recently he found two "Da" locomotives undergoing a 10,000-mile inspection, a "De" locomotive having an 8,000-mile check, and "Rm" 133 having a 2,000-mile check. In the heavy repair shop, "Df" 1501 was undergoing a 100,000-mile overhaul, "Dsa" 225 (which had completed over 12,000 hours of work) was in for tyre turning and general overhaul, and "Dsb" 300 was having an engine change and gearbox repairs.

Incidentally, the repair method used is that known as "unit replacement". Instead of each locomotive having to wait for its own parts to be machined and restored before it can re-enter service, the worn parts from a diesel locomotive are simply replaced by spares. This ensures that each locomotive is out of service for as little time as possible. Sometimes, as in the case of "Dsb" 300, a complete engine change is possible. The parts removed are overhauled and returned to "spare" stock for later use on other locomotives.

Of course, similar methods were used to some extent in steam locomotive practice, whereby boilers and sometimes tenders were "swapped" to avoid delay in returning locomotives to service. But the unit





RIGHT, UPPER: Oil filters removed from diesel locomotives are cleaned thoroughly and efficiently in the special filter-cleaning plant.

CENTRE: A fitter examines connecting rods and gudgeon pins about to be installed in a diesel engine.

LOWER: Elaborate rack for testing Westinghouse air-brake equipment on "Da" class locomotives.

N.Z.R. Publicity Photographs

The advantages of the raised platforms in the inspection bay at Parnell are clearly illustrated in this photograph of two fitters at work on an American "Da" class diesel-electric locomotive.

N.Z.R. Publicity Photograph

replacement method is much more extensively used in diesel locomotive maintenance.

A number of spares are held for each class of locomotive. For example, two complete "Da" bogies are held together with a pair of driving wheels and a pair of idler wheels. These are used on locomotives that have completed about 70,000 miles running, thus enabling the worn wheels to be removed for tyre turning. These wheels and axles are turned at Otahuhu workshops pending installation of the wheel lathe at Parnell.

Establishment of modern locomotive servicing facilities like these has not been accomplished without some problems and some compromise. The site selected had two specific drawbacks which were accepted rather than time-consuming and costly "dead" running out to the nearest alternative site that was considered. The two drawbacks were a foundation soil of somewhat indeterminate character (from the point of view of bearing capacity) and a restricted width of site.

Over many years the area had been a rubbish dump, now covered by artificial fill. Piles were used for the support of the main frames, but the bearing on the floor slabs and pits was still a problem. One method adopted was to introduce jacking slabs under the main pits with facilities to raise the floor small amounts later if found necessary.

The narrow width of the site restricted the space that could be allowed between tracks and, although the place looks spacious enough to the casual observer, somewhat greater spacing of the tracks is considered desirable where possible.

Be that as it may, our reporter could not help contrasting the spacious, light, airy, clean atmosphere of Parnell diesel depot with the traditional steam locomotive sheds. The new locomotives coming this year from Australia may be assured that they will be well looked after ●

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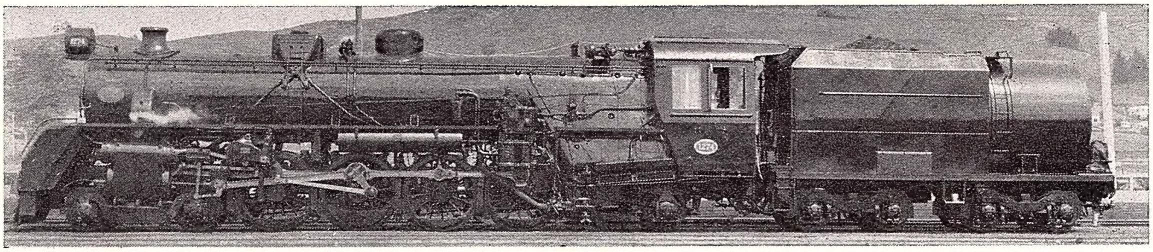
RAILWAY CURIOSITY SHOP

A company, Authentic Railroadiana Supply, has been formed, with headquarters at Peoria, Illinois, to supply the wants of those who seek old railway items such as spikes, railway company emblems, and refreshment car crockery. One of A.R.S. directors is Mr D. L. Keith, who is public relations representative of the Toledo, Peoria and Western Railroad.—From the *Railway Gazette* ●



LAST OF A FAMOUS BREED

Thirty-fifth "Ja" Leaves Hillside Workshops

WILL this be the last steam locomotive ever to be built in New Zealand? It certainly is the last one ordered for New Zealand Railways, and no more orders for steam locomotives are contemplated. Diesel traction has proved its worth for New Zealand conditions.

Thus it was that the emergence of "Ja" 1274 from Hillside Workshops at Dunedin on 7 December 1956 signified the end of an era. For 68 years steam locomotive construction has been an important part of the activities of N.Z.R. workshops. For 60 years Hillside has participated in this work.

Understandably, therefore, the men and women of Hillside treated the event as an historic occasion. As the massive locomotive rolled slowly out of the shops, members of the staff – office girls and all – poured out of surrounding buildings to give it a rousing send-off.

Amateur photographers busily clicked cameras to add to their collections of famous "last" occasions in Dunedin. Many groups proudly posed for their photographs in front of No. 1274, and none more proudly than the workshops officers and men who had been closely associated with construction of 35 "Ja" class locomotives at Hillside in recent years. Office girls clambered into the cab, eager to claim the distinction of having stood on the footplate.

The first locomotive ever built at the Hillside railway workshops was a 37-ton tank locomotive of the "Wa" class in 1897. Eleven of these small locomotives were built altogether between 1892 and 1903, 5 at Addington and 6 at Hillside, and another small tank locomotive (class "L") was completed at Hillside in 1900. Since 1903, 165 more steam locomotives were erected at Hillside.

Sixteen "Wf", 20 "Wg", and 50 "Ww" class tank locomotives were Hillside products of 1907 to 1919. Then followed 20 "Wab" class locomotives between 1923 and 1927, 12 "C" class shunting locomotives in 1930–31, and 6 "G" class tender locomotives in 1937. Six "Kb" class 4-8-4 type locomotives, turned out in 1939–40, were the largest and most powerful non-articulated steam locomotives ever built for New Zealand Railways. Finally, 35 of the successful "Ja" class 4-8-2 type steam locomotives were produced between 1946 and 1956.

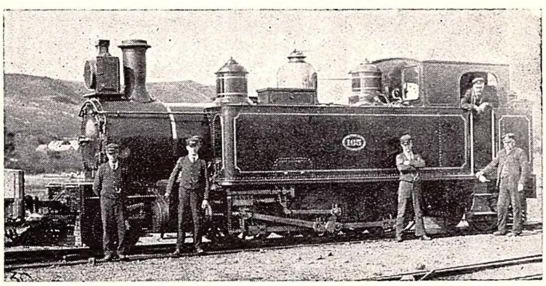
Although all new motive power now being built for New Zealand Railways is diesel or electric more than 150 modern steam locomotives will continue to be maintained at Hillside. For economic and practical reasons complete transition from steam to diesel traction cannot be effected overnight, but as time goes by the maintenance of diesel traction equipment will become a more and more important part of Hillside workshops activities ●

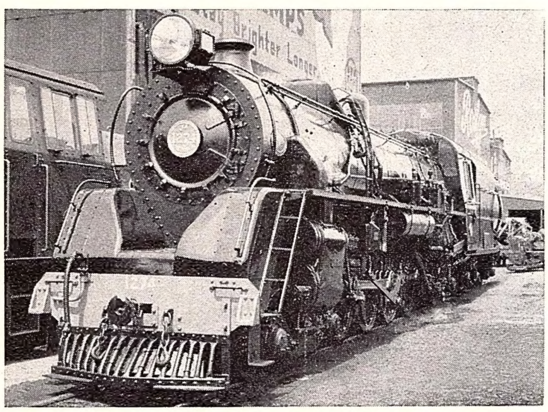
ABOVE: "Ja" 1274 poses for the photographer at Mosgiel while on a trial run.

BELOW, LEFT: Hillside's first locomotive was 37-ton "Wa" 165, a 2-6-2 tank engine built in 1897.

BELOW, RIGHT: Her new paint glistening in the sunlight, "Ja" 1274 stands ready for her initial test run.

N.Z.R. Publicity Photographs





SEVENTY-FIFTH ANNIVERSARY

of an

IMPORTANT NEW ZEALAND INDUSTRY

THREE-QUARTERS of a century ago, on 15 February 1882, the barque-rigged sailing ship Dunedin *left Port Chalmers with a cargo of frozen lamb and mutton. Her historic voyage proved beyond doubt the practicability of shipping meat half-way around the world. It marked the beginning of a new era for New Zealand farming, and led to the development of a valuable export trade now worth £67 million annually.*

Since that bold experiment in 1882, the Railways have been intimately associated with the growth of the frozen-meat industry, and today rail transport is an essential link in the long chain of communications between the New Zealand farmer and his customers abroad.

Every important freezing works in the country is served by rail, and a fleet of 1,400 specially designed wagons has been provided to convey frozen or chilled meat to the main ports for shipment. Almost every pound of New Zealand meat served on the tables of homes in Great Britain, Europe, Canada, and many other countries, goes down to the sea in the white-clad railway wagons that symbolise the wealth of our pastures.

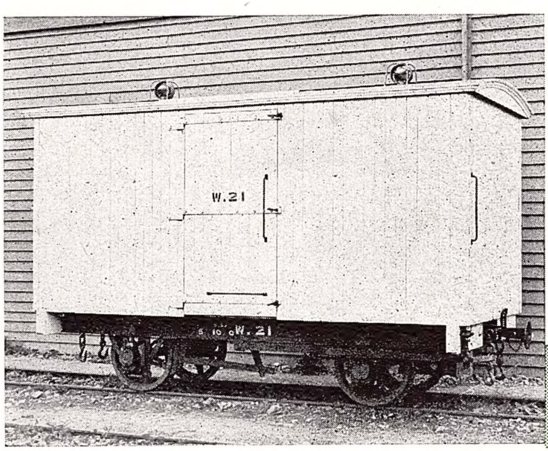
The importance of this traffic to the New Zealand Railways may be gauged from the fact that during the 1955–56 financial year more than 402,000 tons of meat were conveyed by rail, providing a revenue of £878,000.

Although the transport of meat is today carried out with such speed and efficiency that the average person gives it little thought, it was at first a very primitive business. The earliest known use of refrigeration for railway purposes was in 1851, when several tons of butter were transported from Ogdensburg, New York, to Boston, Massachusetts, in a wooden box car insulated with sawdust and stocked with ice. In 1857 meat was conveyed eastward from Chicago over the Michigan Central Railroad in box cars fitted with ice compartments, and by the 1880's refrigerated cars were a common sight on the railways of the United States.

The successful shipment of meat from the Argentine to France in 1877, and from Australia to England in 1879, attracted the attention of the New Zealand and Australian Land Company to the possibility of finding overseas markets for New Zealand meat. The driving force behind this interest was provided by two of the Land Company's officers, William S. Davidson and Thomas Brydone. By 1881 these men, one in Great Britain and the other in New Zealand, had engaged a fast sailing ship (the *Dunedin*), arranged for it to be equipped with the finest refrigerating machinery then available, and constructed a slaughter-house on the company's Totara Estate, south of Oamaru.

The New Zealand Railways made inquiries in the United States and Australia to determine the type of wagon that would be most suitable for conveying the carcasses between Totara and Port Chalmers, where the *Dunedin* was to serve as a freezing works during the three months required for loading.

Information concerning the wagons used on the Victorian and New South Wales Railways was received too late to be of use for the movement of the initial New Zealand consignment, but the details of these vehicles were nevertheless of considerable interest



An early four-wheeled insulated wagon of class "W", built in N.Z.R. workshops during the nineties.
Photograph: A. N. Palmer Collection

and probably influenced the design of the first wagons built in New Zealand.

On 15 November 1881 the General Manager of Railways, Mr J. P. Maxwell, received a telegram from the Traffic Superintendent at Dunedin, stating that Thomas Brydone was to begin loading the *Dunedin* in about two weeks. Brydone proposed to forward some 500 carcasses daily from Totara and required "about ten vans fitted with hooks to hang the sheep from." The following day Mr Maxwell instructed the Locomotive Superintendent at Addington to fit ten vans "with the least possible delay."

Although these vehicles were merely ordinary class "K" box wagons adapted for the purpose, it is obvious from a contemporary press report that some attempt must have been made to keep the interiors cool, as mention is made of ice chests. Here is how an Oamaru newspaper described the methods used for transporting the carcasses:

"Six butchers with attendant satellites are engaged in the sanguinary part of the business and 240 carcasses are despatched to Dunedin every morning by the first train . . . At 4 o'clock every morning work begins when the number killed on the previous day, after hanging to cool for 24 hours, are packed in meat vans fitted for the purpose with hanging apparatus, ventilators and ice chest and five vans each containing from 50 to 60 sheep."

The first carcasses were loaded aboard the *Dunedin* early in December 1881, but soon afterwards a hitch occurred when the ship's refrigerating machinery broke down, necessitating the sale of the cargo. Eventually the machinery was repaired, and by 14 February the cargo had been loaded. On the following day the *Dunedin* moved out of Port Chalmers on her 98-day voyage to the markets of the Old World.

Any hopes that ordinary box wagons would be satisfactory for the 80-mile journey from Totara to Dunedin and back to Port Chalmers were dashed when the Traffic Superintendent at Dunedin wrote

Carcasses of frozen mutton being unloaded from "Vb" wagons into the slings which will transfer them to the ship's hold.

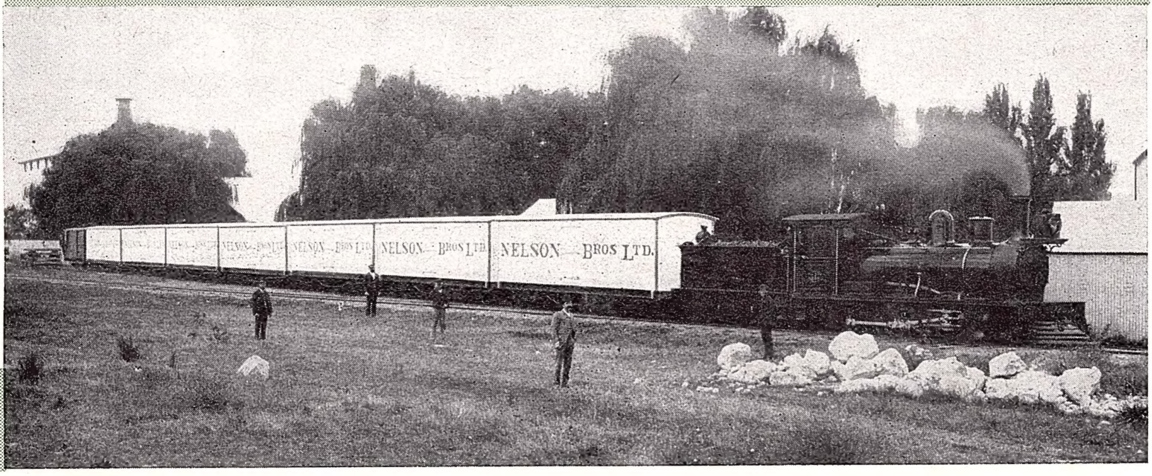
N.Z.R. Publicity Photograph

to the General Manager on 1 March 1882. In this letter Mr Hannay informed Mr Maxwell that the wagons supplied to Brydone would not be satisfactory, as such vehicles should be cool and perfectly air-tight. He recommended the fitting-up of ten wagons with air-tight doors and double roofs.

However, Mr Maxwell had already prepared a design for an insulated wagon based on the American pattern, and on 24 March 1882 the Minister for Public Works approved the immediate construction of five meat vans to suit the requirements of the New Zealand Refrigerating Company, whose Burnside freezing works were the first in the country.

Eight of these "V" wagons were built for Nelson Bros. Ltd. (Hawke's Bay) about 1890. Here they are seen about to leave Tomoana freezing works for Napier, hauled by an old "J" class 2-6-0 locomotive.

Photograph: Courtesy Alexander Turnbull Library



This order was followed three months later by another for five additional wagons, and in September the construction of ten more was approved for the Canterbury Frozen Meat Company's Belfast Works – the first in Canterbury. By 31 March 1883 the New Zealand Railways possessed 33 meat wagons – 13 on the Wellington Section and 20 on the Hurunui-Bluff Section.

Originally classified "K2" (the classification was not changed to "W" until 1892), these wagons appear to have been of the insulated type, as the relatively short distances between freezing works and ports rendered unnecessary the construction of fully refrigerated vehicles. Little is known about these early wagons, but one type designed for the Napier Section in July 1882 possessed some rather interesting features, such as a double roof, with an air space between the two sheathings, and an arrangement of pipes which could only have been for pre-cooling by means of cold air pumped in at the freezing works.

Bogie meat wagons had been suggested as early as 1882 by the Locomotive Superintendent at Addington (Alison D. Smith), but four years were to elapse before the first four "V" class wagons appeared in service. The "V", which was designed by Robert J. Scott (later Professor of Engineering at Canterbury College), was a bogie vehicle 30 ft. long with insulated walls, roof, and floor. It had more than double the capacity of the four-wheeled "K2" wagon. By the turn of the century the fleet of insulated wagons consisted of 91 "W's" and 57 "V's", to which had to be added eight "V" class wagons built for Nelson Brothers Ltd., Tomoana (Hawke's Bay), and a further seven "V's" built for the Longburn Slaughtering and Freezing Company. The latter vehicles were classified "Fv" by the Wellington and Manawatu Railway Company, over whose line they operated.

The Manawatu Railway itself owned several frozen meat wagons, the first three of which were the 22 ft. four-wheeled vans of class "K3", later classified "Ka". About 1900 the company built four American-style bogie insulated wagons, class "Fv", and in 1906 three "W" class four-wheeled insulated wagons appeared.

A new type of bogie wagon was introduced by the Government Railways in 1910, when insulated bodies were built on the underframes of ten "Ub" flat wagons. Classified "Vb", the new wagons were 37½ ft. long and slightly wider than the "V". Their capacity was 420 carcasses, compared with the "V's" 300–350 carcasses. This type of wagon soon proved its worth and was built in large numbers, the latest version being produced in 1944.

An important development in the New Zealand frozen meat industry was the shipment, in 1933, of the first consignment of chilled beef to Great Britain. To transport this highly perishable consignment from Waingawa (near Masterton) to Wellington, the Department provided several "Vb" wagons fitted with rails and hooks to enable the beef carcasses to be hung from the ceiling.

The experimental shipment was very successful, the meat finding a ready sale on the London market, but the opening-up of this new traffic provided the Railways Department with several transport problems.

Unlike mutton or lamb, beef cannot be transported long distances in a frozen condition, as it loses both weight and flavour. It cannot be stacked for transport, but must be hung, and also must be handled with extreme care to ensure that it does not become bruised.

The marketing of beef from the Western and Southern Hemispheres became an economic possibility with the introduction of the "chilling" process and the advent of faster ships. Chilled beef is carried at a temperature of 29°F., at which it is not frozen and so will not keep fresh for more than a limited period. As an added precaution carbon dioxide gas is introduced into the atmosphere of the storage holds to lengthen the time the beef will stay fresh. This ensures that New Zealand beef reaches the British consumer in a condition practically equal to that of home-killed meat, despite a voyage of about 30 days.

The adaptation of frozen-meat wagons for the railage of chilled beef was merely a temporary expedient, as these vehicles did not have sufficient interior headroom to hang the large beef carcasses, and more than ordinary insulation was required.

The next step, late in 1933, was to rebuild seven 37½ ft. "Vb" wagons with higher and stronger roofs and ice bunkers holding one ton of ice. In appearance these vehicles closely resembled the traditional American refrigerated car, the likeness being enhanced by the provision of roof-top catwalks, ice hatches, and ladders on the sides. They formed the nucleus of a large fleet of "Vb's" built up to 1954 for chilled beef traffic. Six "V" class wagons with similar, but smaller, bodies were built in 1934.

Today the New Zealand Railways possess a fleet of 1,403 insulated wagons for the conveyance of frozen and chilled meat. Most numerous are the four-wheelers of classes "W", "Wa", and "Wb", of which there are 784. There are 271 "chilled beef" bogie wagons of class "Vb" and six of class "V", and 342 insulated bogie wagons for frozen mutton (236 "Vb" and 106 "V").

This large fleet of special-purpose vehicles is to be augmented by a further 200 bogie chilled-beef wagons of an improved type. To be classified "Vs", these wagons have been designed to New Zealand Railways requirements by the Commonwealth Engineering Co. Ltd., Sydney. They reflect the latest trends in refrigerated wagon design, and incorporate several features of interest.

All existing refrigerated and insulated wagons on the New Zealand Railways have wooden bodies mounted on steel underframes, but the "Vs" will be of all-steel construction. Insulation will conform to the most modern standards, including the use of fibreglass, and the cambered floor will be protected by galvanised steel or aluminium gratings draining into side channels. The bogies are to be of an improved design developed by the Railways Department, and the axles will be mounted in roller bearings.

These fine wagons will set new standards for the conveyance of frozen and chilled meat, and will enable the Railways Department to cope more readily with large concentrations of refrigerated ships at New Zealand ports.

The Railways are providing evidence of their determination to keep abreast of the times, and their intention to continue their vital and essential role in the development of a truly great New Zealand industry ●

FACTS IN A FLASH!

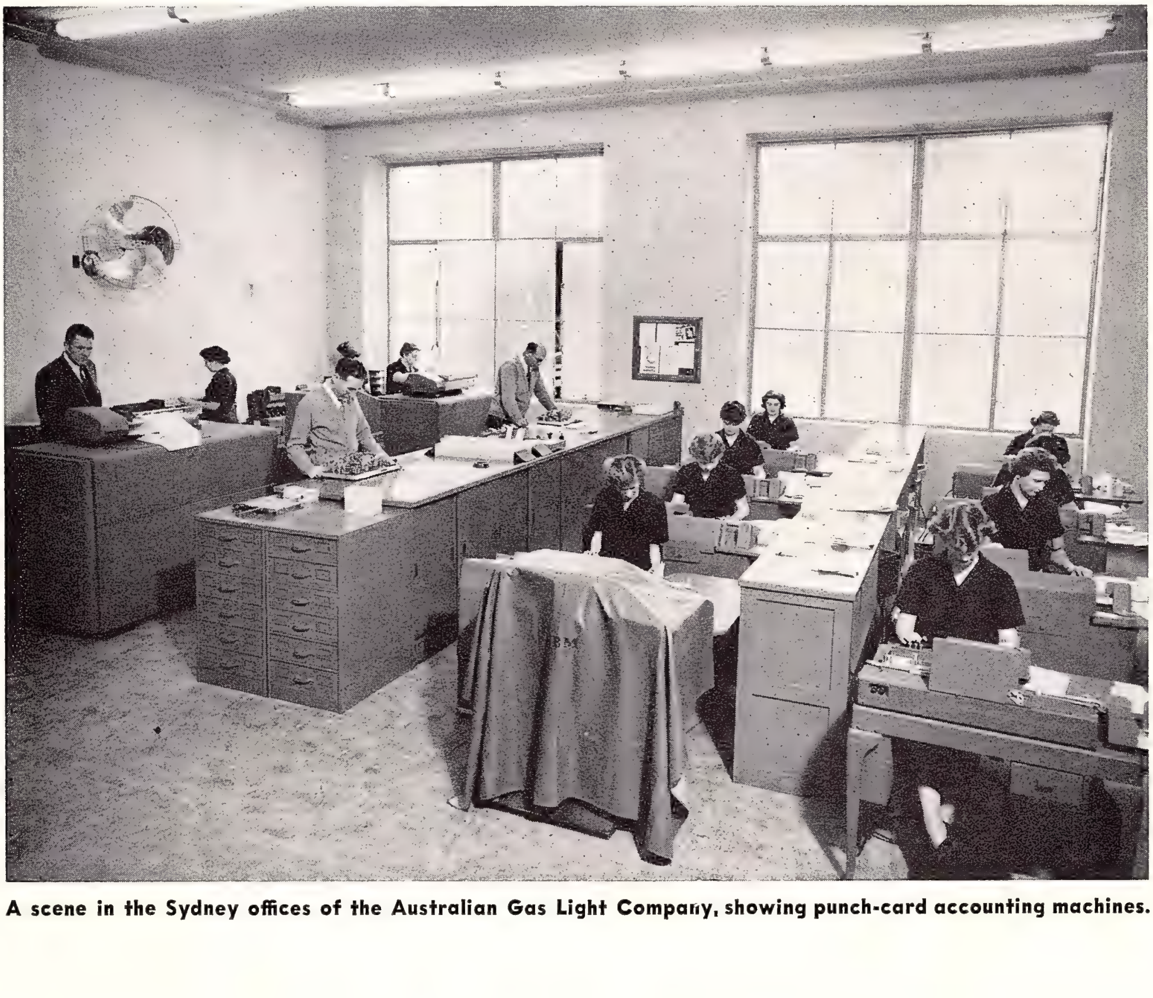
ELECTRONIC COMPUTERS SPEED ACCOUNTING

PAYSHEETS, to hundreds of railwaymen, mean days and days of tiring work. "Brain fag" is the common term. Columns and columns of figures have to be added, cross-totalled, checked, and balanced; all the paysheets and associated summaries have to be laboriously prepared by hand. Now, all this is to be changed. Modern electronic accounting machines are to take over all the routine tasks. They will eliminate the drudgery. In the twinkling of an eye (almost!) they will complete and verify lengthy calculations that formerly occupied hours. The first of the new machines are scheduled to begin work in April.

Machine aids, of course, have been used before by New Zealand Railways and their use has steadily been extending. Typewriters, addressographs, adding machines, calculators, book-keeping and ticket-issuing machines: all are examples of the use of machines to ease human toil. The punched-card accounting machines installed in the Chief Accountant's office in 1921 for goods balancing and commodity statistics were the first of their type in New Zealand.

In quite recent years, spectacular advances have been made in the development of electronics and the application of new knowledge in the design of accounting machines. Rapid advances continue to be made. Therefore, the Department will rent its new equipment from the suppliers rather than purchase it outright. This will make it possible to replace machines and equipment as new and improved types become available.

The new machines will bring vast changes in accounting methods on our railway system, changes so vast in fact that they could not possibly be effected overnight. Not only do the new procedures have to be worked out in detail, but the effects of the changes on staff requirements have to be considered. Necessarily, there will be reallocation of staff as employees



A scene in the Sydney offices of the Australian Gas Light Company, showing punch-card accounting machines.

are released from present duties for more creative activity. At the same time, staff has to be trained to understand and to operate the new equipment. In accordance with present-day Departmental policy, employees are assured that their interests will be safeguarded and that the human side of the process of mechanisation will not be ignored.

Because of the extent of the preparation necessary for the large-scale changes now envisaged, it will be some three years before the full scheme is in operation. When completed, however, paysheets and statistical data will be produced at revolutionary speed. Facts and figures about railway operations, being ready sooner, will be of even greater value than they are now. In fact, American railroads say that the improved management made possible by the timely, digested information turned out by the new computers is far more important than the clerical cost savings obtained.

Under the new system, clerical personnel concentrate on correctly recording data and events in a language and form that both human beings and machines can understand. The information is then passed through the machines by skilled operators for processing, producing a series of outputs and by-products.

Basic data has to be translated into language that the machines can understand, but once this is done there is practically no limit to the variety of calculations that can be made at amazing speed. The method normally used is to punch holes on a card form of standard size in positions representing either figures or letters of the alphabet.

The first machines to form the nucleus of the main installation in Wellington are now in various stages of delivery. They comprise the following:

Card Punches: To record numerical or alphabetical data on cards by means of holes punched by depressing keys, basically the same operation as typing.

Verifiers: The key strokes used in punching the holes are repeated on the verifier by another operator. Any discrepancies cause the machine to stop.

Sorters: To group cards in numerical or alphabetical sequence according to any classification punched in them.

Punch-card accounting machines installed in the offices of the Social Services Department, Sydney.

Electronic Calculators: To perform additions, subtractions, multiplications, or divisions and punch the result (almost instantaneously) in a card.

Alphabetic Accounting Machines: To print information from each card as it passes through the machine. These machines prepare statements showing complete details, such as paysheets and pay dockets, and at the same time can add, subtract, cross-add, or cross-subtract, and print many combinations of totals.

The new Mechanised Accounting Section established in the Chief Accountant's office at Wellington will handle the work now being done by the obsolete punched-card equipment of 1921 (goods balancing and commodity statistics). Then, about May, it is hoped to take over preparation of the payroll for the Way and Works Branch at Wellington, with extension of the application to the other Way and Works districts and to other branches as soon as practicable.

Other phases of accounting work to be mechanised will be taken over by stages as additional equipment is received and installations are set up in Auckland, Christchurch, and Dunedin.

Typical of the work to be done is the compilation of the fortnightly payroll. Allocations of the hours booked on timesheets will be performed by hand, but from that stage machine processes will be used throughout. Cards showing the hours worked and allowances to be paid will be punched from the timesheets and the calculator will complete the pricing out and punching in the money values.

These earnings cards, together with other cards recording deductions and other information, will then be passed through a group of machines comprising an accounting machine, electronic calculator, and summary punch linked together. These machines will (i) total the gross pay for each employee; (ii) calculate and deduct social security charge; (iii) make other deductions, or punch arrears cards if the employee has insufficient earnings to meet the deductions; and (iv) print simultaneously the payroll, in separate sheets for each pay station, and a complete pay docket for each employee.

The pay docket will show, not only in detail how the gross pay is made up, but also what deductions have been made, the year's earnings to date, and the number of days of annual leave that are due. In subsequent operations the machine will produce an analysis of the cash required for paying out and other documents required for accounting purposes.

Introduction of these revolutionary new accounting methods marks a big advance in the modernisation of railway operation in New Zealand. Progress is largely achieved by a continuous process of revision of procedures and methods and advances to better equipment, and any organisation that lags in this respect is inefficient in comparison with its competitors. The new equipment and methods will release many people from routine clerical work for more creative activity. They will produce accurate figures quickly, at relatively low costs, and in time to be of added use and value to management. They will help keep New Zealand Railways in the forefront of progress ●

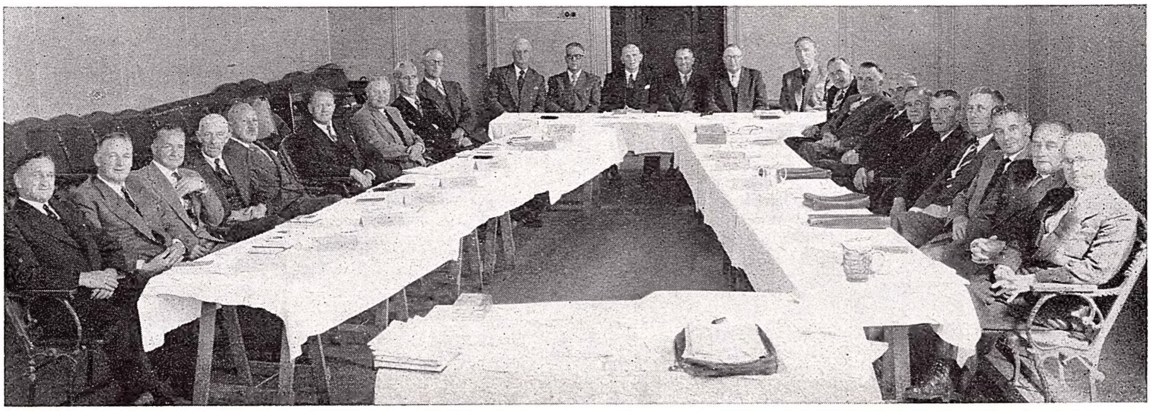
APPOINTMENT OF CHIEF STATIONMASTERS

TO promote operating efficiency and better public and staff relations, an important change in Traffic Branch organisation was effected in December last. Thirty-four chief stationmasters, each in charge of a small area to give compact units of traffic control and greater local autonomy, were appointed in place of 51 senior stationmasters.

Within their local areas, chief stationmasters are responsible for ensuring the optimum use of wagons, ropes, and tarpaulins – remembering that idle wheels earn no wages – and, generally, for ensuring that our customers obtain the service they require.

Assistant stationmasters relieve their chiefs of time-consuming but necessary routine administrative work at headquarters, and ordinary stationmasters continue to exercise control at other stations within the Chief Stationmaster's area. Chief stationmasters are expected to be out and about, constantly seeking improvement in the service.

There is plenty of scope for drive and initiative, and success of the scheme will pay handsome dividends to the Department and its clients



CONFERENCE OF CHIEF STATIONMASTERS, PALMERSTON NORTH

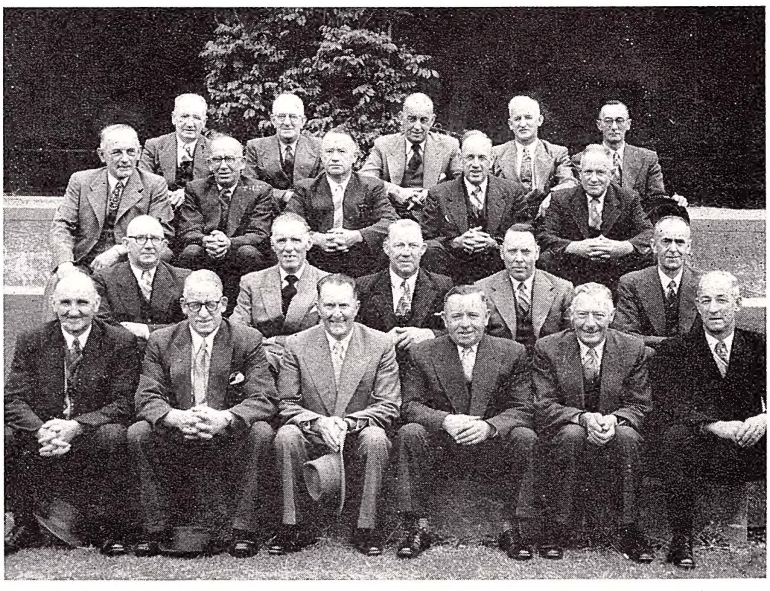
***FROM LEFT*: Messrs C. Eckhold (Maungaturoto); A. T. Bedingfield (Auckland); R. C. A. Ledez (Otahuhu); H. G. C. Munro (Huntly); R. S. W. Smith (Frankton); A. R. Harre (Paeroa); R. J. Love (Rotorua); J. M. Jermy (Tauranga); A. Anderson (Taihape); P. Hogan (D.T.M., Wanganui); K. D. Croft (D.T.M., Wellington – since retired); J. G. Whetton (D.T.M., Auckland – since retired); K. G. Reid (Chief Personnel Officer, G.M.O.); W. F. Gill (Personnel Manager – since retired); H. W. Watts (secretary to conference); H. W. J. Veal (Marton); R. G. Sewell (Wanganui); A. W. Hearle (New Plymouth); R. McDonald (Palmerston North); N. H. Dunckley (Dannevirke); J. B. Meachen (Napier); V. D. Soper (Gisborne); H. E. McCalman (Masterton); K. V. N. Durney (Wellington).**

N.Z.R. Publicity Photograph

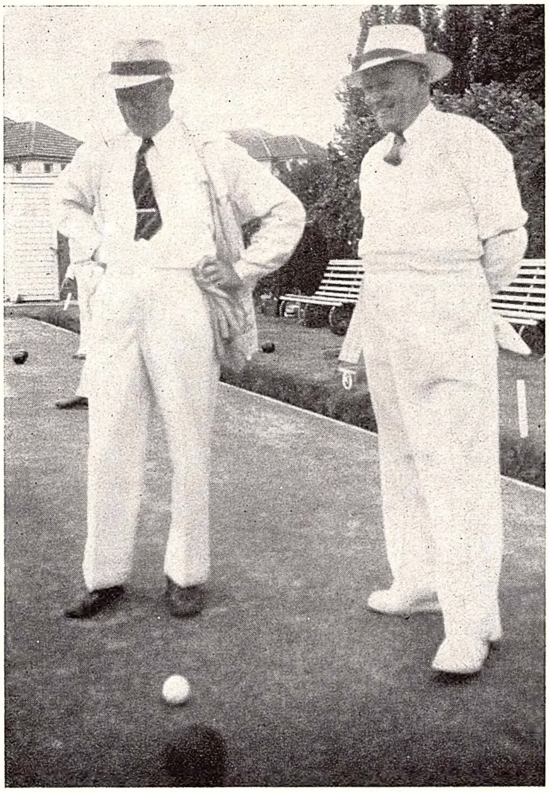
CHIEF S.M.s MEET AT TIMARU

***FRONT ROW*, from left: Messrs A. Hazlett (Petone); E. W. Hayton (D.T.M., Ch'ch); K. G. Reid (Chief Personnel Officer); F. R. Murray (Transptn. Supt.); D. M. Hoult (D.T.M., Dunedin); W. J. Johnston (Invercargill); *2ND ROW*: L. T. Brown (Rangiora); H. W. Watts (secretary); L. J. Anderson (Westport); N. T. O. Densem (Dunedin); A. E. Haigh (Gore); *3RD ROW*: R. A. B. Beach (Oamaru); J. A. M. Reid (Ashburton); C. J. Millin (Greymouth); A. J. F. Homan (Balclutha); A. Auld (Blenheim); *BACK ROW*: L. E. Morrison (Timaru); T. J. Dwyer (Whangarei); E. C. Brittenden (Taumarunui); W. Newburn (Ch'ch); M. A. Tie (Ranfurly).**

Photograph: Courtesy Langwood Studio



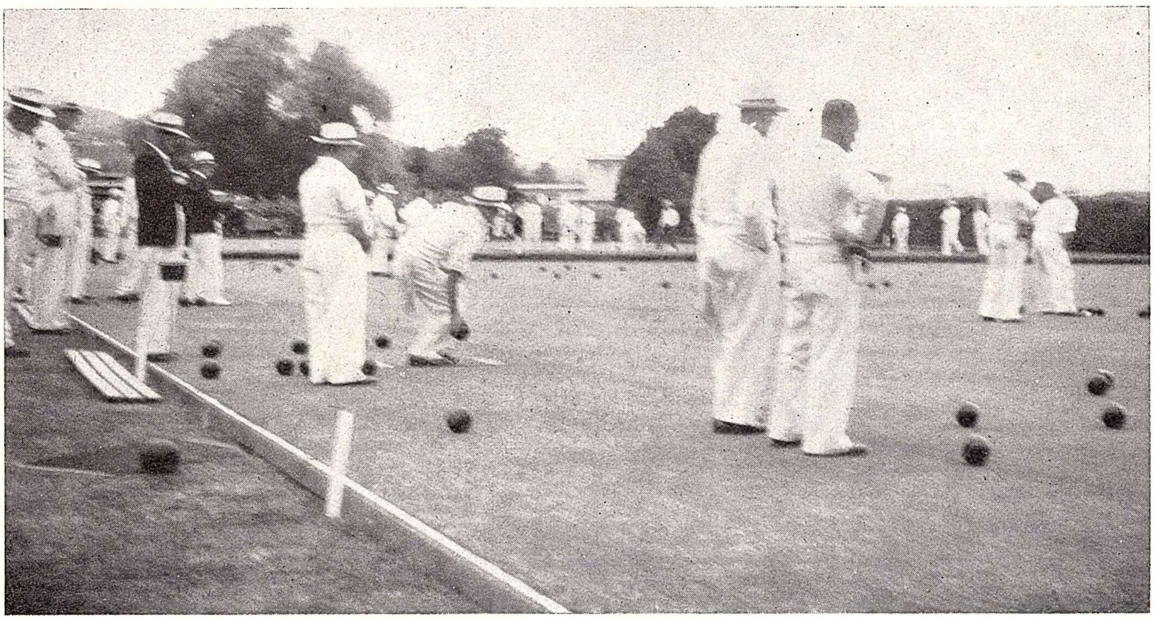
THE RAILWAY WORLD OF SPORT



THESE photographs were taken on the Naenae Bowling Club's green, Lower Hutt, on 16 December 1956. The occasion was the Southern Railway District's annual bowling tournament, at which were selected the two teams to compete in the North Island Railway Championships held at Otahuhu on 10 February.

LEFT: Two skips watching the efforts of their respective teams with keen interest. At left is Mr W. E. Worsfold, a former Staff Superintendent, and at right Mr C. E. Smith, Assistant Transportation Superintendent. Mr Smith's team won the tournament with six games. His team mates were Messrs C. H. Bray (Director of the Railways Commission), Mr H. W. Kelleher (a former Assistant Chief Accountant), and A. J. Levick (who retired some years ago from the position of Staff Superintendent).

BELOW: A general view of the game in progress●



OVERSEAS RAILWAYS

(5) EAST AFRICAN RAILWAYS

THE British East African territory of Kenya has been in the news during the past two or three years owing to the Mau Mau uprising and terrorist activity, now happily being brought under control. Railways in this area of Africa, constructed on the metre gauge (3 ft. 3⅜ in.) are operated by the East African Railways and Harbours Administration, the longest main line extending inland from Mombasa through Nairobi to Kampala in Uganda, a distance of 871 miles, surmounting a summit of no less than 9,136 ft. (almost on the Equator) in the process. A 209-mile extension westwards from Kampala was opened only last year.

From the port of Dar-es-Salaam in Tanganyika, another main line extends 780 miles inland to Kigoma on Lake Tanganyika, with a 236-mile branch line to Mwanza on Lake Victoria.

Over a route milage almost the same as that of New Zealand Railways, the tonnage of goods conveyed by East African Railways is just over one-third of the New Zealand figure, but the average length of haul is more than three times as great, so that net ton-miles and traffic density are somewhat greater in East Africa. To move this heavy traffic, locomotives in East Africa are of exceptional power and rolling stock is of high capacity.

The following information is corrected to 31 December 1954.

Extent of the System

Route Milage Worked: 3,245 miles, all single track, none electrified.

Locomotives: 333 steam (including 109 Beyer-Garratt articulated), 19 diesel shunting.

Coaching Stock: 836 vehicles, including 16 restaurant cars, 3 railcars, and 472 non-passenger vehicles.

Goods and Livestock Wagons: 7,830, including 463 livestock, 760 tank, and 426 service wagons. The 5,873 general-service goods wagons (2,330 open and 3,543 covered) had an average carrying capacity of 25·5 tons each. The most numerous class of wagon in use was the bogie covered goods type, of which there were 2,245 with an average capacity of 31·6 tons each and an average tare of just over 13 tons.

Traffic (Year 1954)

Passenger Journeys: 5,169,139, plus special train traffic. The average receipts per passenger journey ranged from 4s. for each of the 4,921,184 third-class journeys to £3 12s. for each of the 205,572 first-class journeys.

Goods and Livestock: Revenue-earning traffic amounted to 3,904,300 tons hauled an average distance of 331 miles. Including free-hauled departmental traffic, total net ton-milage amounted to 1,482·4 million. The 312,057 head of livestock conveyed (mainly cattle) were not included in the foregoing figures. Important export products conveyed included cattle cake, cotton, coffee, sisal, and soda ash. Cement, maize, and timber were other important traffic items.

Items of Interest

Weight of Rails: From 40·3 lb. per yard in parts of Tanganyika to 95 lb. per yard on heavy-traffic main lines in Kenya.

Track Construction: Steel trough sleepers with clips and bolts; stone ballast.

Maximum Axle Loadings: Examples are 18 tons on 80 lb. per yard rails; 13 tons on 60 lb. per yard rails.

Maximum Authorised Speeds: 40 m.p.h. in Kenya; 28 m.p.h. in Tanganyika.

Maximum Moving Dimensions: Height above rail level, 13 ft. 6 in.; width, 10 ft. 6 in.

Maximum Altitude Attained: 9,136 ft. (near Timboroa).

Steepest Gradients: Generally 1 in 67 on main lines.

Sharpest Curves: 573 ft. (8½ chains) radius.

Typical Locomotives—

Sixteen "29" class oil-fired 2-8-2 locomotives with 13-ton axle loading and 8-wheel tender, 126·3 tons in working order; engine weight, 73·8 tons; adhesive weight, 51·9 tons; two cylinders 18 in. by 26 in.; coupled wheel diameter, 4 ft.; working pressure, 200 lb. per square inch; introduced in 1951–52.

Twenty-nine "60" class oil-fired 4-8-2+2-8-4 Beyer-Garratt locomotives with 11-ton axle loading, 153 tons in working order; adhesive weight, 88 tons; four cylinders 16 in. by 24 in.; coupled wheel diameter, 4 ft.; working pressure, 200 lb. per square inch; introduced in 1953–54.

Thirty-four "59" class oil-fired 4-8-2+2-8-4 Beyer-Garratt locomotives with 20-ton axle loading, 252 tons in working order; adhesive weight, 159·5 tons; four cylinders 20½ in. by 28 in.; coupled wheel diameter, 4 ft. 6 in.; working pressure 225 lb. per square inch; introduced in 1955 (the largest locomotives on metre or 3 ft. 6 in. gauge railways in the world).

Typical Train Services—

5.0 p.m. Mombasa–Nairobi daily, 330 miles in 15 hours with 13 stops; continues thence thrice-weekly as—

9.0 a.m. Nairobi–Kampala, 541 miles in 26 hours 30 minutes with 21 stops.

(From Nairobi to Mombasa, coastbound, the allowance is 14 hours.)

Average Net Load of Goods Trains (Revenue Earning): 201 tons (the corresponding New Zealand figure last year was 131 tons).

Maximum Train Weights: 1,280 tons.

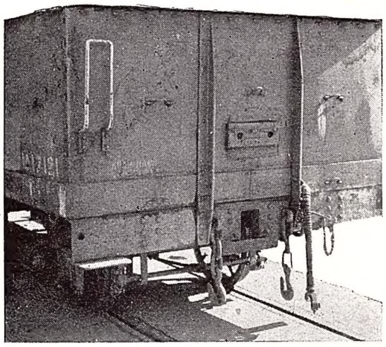
Tunnels: Of three tunnels, the longest is the Limuru Tunnel, 2,500 ft.

Other Activities: East African Railways also operate five ports on the Indian Ocean, steamship services over 6,000 route miles on four inland lakes and on the River Nile, and 1,700 route miles of road services.

Rolling Stock Liveries: Locomotives, maroon; passenger coaches, maroon and cream; and freight wagons, aluminium ●

Before leaving in December to take up the position of assistant surveyor/navigator with the New Zealand Antarctic Expedition, Mr R. A. Carlyon, of the District Engineer's Office, Wanganui, was entertained at the General Manager's Conference by the Railways Commission and heads of branches. Here Mr Carlyon (second from right) is seen with Messrs C. H. Bray (Director), A. T. Gandell (General Manager), and W. E. Hodges (Chairman).

N.Z.R. Publicity Photograph



THIS WAGON MAY BE A KILLER!

PICTURED above is probably the greatest hazard encountered in shunting – a wagon without a buffer. Frequent attention has been drawn to the dangers of handling these wagons, but accidents still occur and are usually associated with serious or even fatal injuries. Note the difference in clearance between the two wagons with buffers (below, left) and the pair with a buffer missing (below, right). The injury most frequently sustained from being crushed between the latter two is a fractured pelvis, but such other things as fractured thighs and ribs, and even amputation as the result of falling and being run over, are not uncommon.

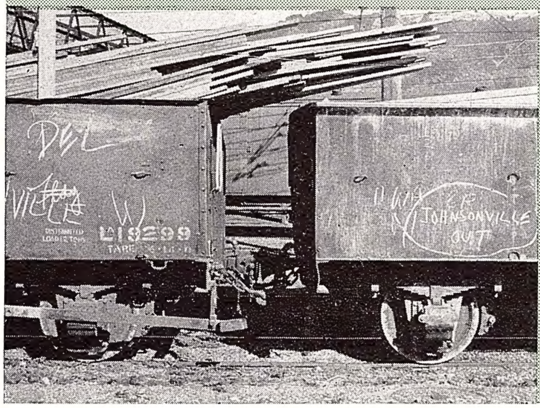
Initially care should be taken to ensure that shunting is so controlled that damage to buffers is avoided. Violent impact is the main cause of this and the damage may not be readily apparent, the buffer failure occurring at some later stage when perhaps a guard or a station agent is in a position to sustain major injury.

When it is known that a buffer is broken, every possible precaution should be taken to ensure that the wagon is handled safely. It should be adequately marked and whenever possible should be so placed in the yard that it need not be handled again except when being attached to the rear of a train for dispatch to a car and wagon depot. This should be done at the earliest possible moment.

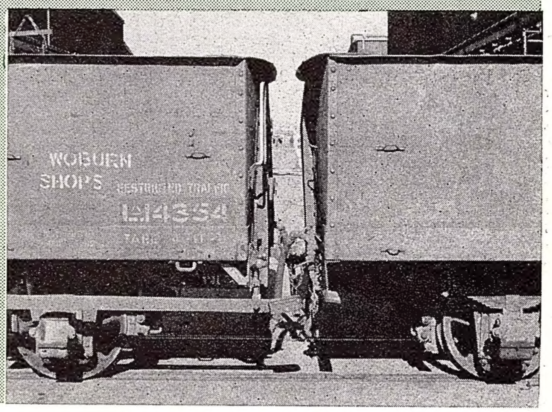
When a wagon of this type is being shunted it must be remembered that there are no short-cuts. Haste must be avoided and no attempt made to couple side-chains until such time as all movement of engine and wagons has ceased. Make allowance for the surge and ensure that the driver knows what you are doing.

Remember that this, like any other job you do, is as safe or as dangerous as you make it. It can be done safely if you take adequate precaution. If you take shortcuts, or insufficient care, you may be coupling your last wagon●

SAFE



UNSAFE



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